

Wastewater Infrastructure Policy Working Group (Working Group)
July 12, 2021, 1 p.m. to 2 p.m.
Meeting Summary

Meeting Location:

Virginia Department of Health
5th Floor Conference Room
109 Governor Street
Richmond, VA 23219

Virtual:

Virtual meeting access via WebEx platform.

List of Attendees:

Working Group Members

M. Norman Oliver, MD, MA,
State Health Commissioner
Virginia Department of Health (VDH)

David Paylor,
Director
Virginia Department of Environmental Quality (DEQ)

Stephanie Hamlett
Executive Director
Virginia Resource Authority (VRA)

Jay Grant,
Director of Outreach, Planning, and Compliance
Virginia Department of Housing and Community Development (DHCD)

Other Participants

The Honorable Senator Ghazala Hashmi
Ann Jennings, Deputy Secretary of Natural and Historic Resources
Julie Henderson, Director, Office of Environmental Health Services (OEHS), VDH
Karri Atwood, Legal Affairs, OEHS, VDH
Jim Baldwin, Executive Director, Cumberland Plateau Planning District Commission
Chris McDonald, Director of Government Relations, Virginia Association of Counties (VACo)
Danna Revis, President Elect, Virginia Onsite Wastewater Recycling Association (VOWRA)
Andy Crocker, Virginia Infrastructure Programs & Regional Training Manager, Southeast Rural
Community Assistance Project (SERCAP)
James Dillon, Technical Assistance Provider, SERCAP
Duane Miller, Executive Director, Lenowisco Planning District Commission
Pat Calvert, Senior Policy & Campaigns Manager, Virginia Conservation Network

Ted Henifin, General Manager, Hampton Roads Sanitation District
Mike Ritchie
Perry Hickman, Community Programs, USDA Rural Development
David Blount, Deputy Director, Thomas Jefferson Planning District Commission
Elizabeth Andrews, Director, Virginia Coastal Policy Center at William and Mary
Karen Doran, Program Manager, Office of Clean Water Financing and Assistance, DEQ
Kirk Havens, Director, Center for Coastal Resources Management at the Virginia Institute of Marine Science
Hope Cupit, President and CEO, SERCAP
Lance Gregory, Director, Division of Onsite Sewage and Water Services, OEHS, VDH

1. Call to Order, Welcome and Introductions

Deputy Secretary Jennings welcomed the group to the first meeting of the team, and each of the Working Group members and participants introduced themselves. Deputy Secretary Jennings noted the interagency effort was initiated as a result of the Chesapeake Bay Phase III WIP, which only touched the surface on what is necessary to achieve equitable access to proper wastewater infrastructure. She noted that the goal of the Commonwealth is to prioritize universal access to wastewater treatment that protects public health and the environment and supports local economic growth and stability. Deputy Secretary Jennings thanked the new members and stakeholders for engagement in this effort.

2. Remarks by Senator Ghazala F. Hashmi, Senate District 10

Deputy Secretary Jennings introduced Senator Hashmi. Senator Hashmi sits on Agriculture, Conservation, and Natural Resources Committee, the Education and Health Committee, the General Laws and Technology Committee, and the Local Government Committee. Senator Hashmi successfully patroned SB 1396, which included the formation of the Working Group.

Senator Hashmi shared her appreciation for the opportunity to carry SB 1396, and to be part of the discussion with the Working Group. She noted the legislation sought to prioritize universal access to wastewater treatment as a human right and to address serious infrastructure needs throughout the Commonwealth. Senator Hashmi gave background on infrastructure needs and climate change, which can put a huge burden on our existing infrastructure. She noted a need to put emphasis on infrastructure before we face major catastrophe. The legislation seek to address environmental justice issues and public health issues impact all of us.

3. Selection of a Chair for the Wastewater Infrastructure Policy Working Group

Commissioner Oliver nominated Director Paylor to serve as the Chair for the Working Group. The motion was seconded and all members were in favor of the nomination.

Director Paylor stated that the remaining business of the Working Group is to hear presentations, and turned it over to Mr. Gregory to go over recommended guidelines and work plan.

4. New Business

i. Review and approve Wastewater Infrastructure Policy Working Group guidelines.

Mr. Gregory gave general background on the Working Group itself, and reviewed the code language on members and ex-officio members. He noted the expiration of this group on July 1, 2030. He went over proposed general rules for the Working Group based on rules used by other VDH committees. He noted that there is interest for keeping Working Group meetings semi-formal to encourage public participation, a need for quorum present in person, minutes posted on town hall within 10 days following the meeting, and review of voting members ability to vote by proxy. He also noted that Virginia code allows for substitutions for committee members, and reviewed the framework for expectations of general conduct.

Mr. Crocker commented that section in the draft rules on referrals to working groups seemed redundant. Director Paylor agreed and that section was stricken.

ii. Review and approve Wastewater Infrastructure Policy Working Group participants.

Mr. Gregory reviewed ex officio members of the Working Group and stakeholders invited to the initial meeting. He asked whether there were any suggestions for other stakeholder groups that may be interested in participating in future meetings. Deputy Secretary Jennings noted a list of representatives from planning district commissions who were also interested in participating. There was also a recommendation to reach out to the Virginia Municipal Leagues.

iii. Review and approve Wastewater Infrastructure Policy Working Group 2021 Work Plan

Ms. Atwood reviewed a draft work plan and deliverables from the Working Group. Per SB1396, a report is due to the General Assembly and the Governor before the beginning of the 2022 General Assembly Session. Ms. Atwood shared a proposal for designees of Working Group representatives to hold three meetings throughout the state in the eastern, central, and southwestern region to seek feedback on four specific questions.

1. How to promote public education about the importance of adequate wastewater treatment?
2. How to encourage collaboration among local, state, and federal government entities, including consistent collaboration and coordination of grant requirements and timelines?
3. How to endorse community-based and regional projects as opposed to cumulative and repetitive site-by-site individual solutions and integrated solutions across sewer and onsite wastewater treatment systems.
4. How to support prioritized, focused, and innovative uses of state and federal funding to address needs determined pursuant to the wastewater infrastructure needs assessment required under § 62.1-223.3.

Several tentative dates were proposed in the work plan for the meetings; September 8th, 15th, and 22nd. VDH staff are exploring locations for each date.

Members of the working group discussed helping to spread the word regarding the three meetings to include diverse input. Director Hamlett asked whether a quorum of the Working Group members or their designees would need to be present at the regional meeting. Director Paylor said he and staff would review that need. Mr. Calvert requested a list of members and alternates, which will be provided when it is finalized.

Mr. Gregory noted that VDH has put together an informal report with the help of VIMS. Dr. Havens from VIMS has been a major player in this effort and will now present on their analysis and tools.

Mr. Baldwin asked whether the Working Group would play a role in the upcoming needs assessment request from the U.S. Environmental Protection Agency.

Director Paylor commented that it may.

5. Presentation by Dr. Kirk Havens, Director, Center for Coastal Resources Management, Virginia Institute of Marine Science at the College of William and Mary
Analysis of Failed, Failing or Threatened Septic Systems in the Coastal Plain

Mr. Gregory introduced Dr. Havens, noting the amazing work that Dr. Havens and the team at VIMS have done developing tools to assess wastewater infrastructure needs in Coastal Virginia.

Dr. Havens then walked through the attached presentation, highlighting the contributions from Dr. Molly Mitchell, Robert Isdell, Julie Herman, and Christine Tombleson. He noted VIMS is currently conducting analysis of failing septic system in the Coastal Plain of Virginia. He provided a slide showing that a large contention of the Coastal Plain does not have sewer, and relies on septic systems. He commented that septic systems require unsaturated soils, and how sea level rise and impacts on ground water levels are creating an issue for many coastal systems. Based on tidal gauges, not only is sea level rising it is accelerating.

Dr. Havens noted that onsite sewage system contribute approximately 6% of total nitrogen to the Chesapeake Bay. Future risk from the impacts of sea level rise need to be taken into account. As more systems are impacted, we'll have more and more issues with human health and water quality impacts.

Dr. Havens noted the goals of the project VIMS has undertaken is to assess changes in septic failure with changing climate conditions. The assessment includes looking for possible connections with shellfish closures. Dr. Havens noted the work began by looking at VDH repair permit data, and using that data to identify hot spots. The next step is to expand the analysis across the entire Commonwealth.

Ms. Revis noted that many of the studies used to establish the estimated nitrogen load from septic systems to the Chesapeake Bay use data from geologic conditions that differ from those in Virginia.

Mr. McDonald ask whether anyone is studying the correlation and impact of infrastructure needs on property values.

6. Public comment.

Ms. Cupit commented on the work SERCAP does and asked if the Working Group is going to look at how the group can help homeowners. That will be a part of the discussion.

7. Adjournment

Wastewater Infrastructure Policy Working Group
§ 62.1-223.2
July 12, 2021, 1 p.m. to 2 p.m.
Meeting Agenda

Meeting Location:

**Virginia Department of Health
Main Floor – Mezzanine Conference Room
109 Governor Street
Richmond, VA 23219**

Virtual:

Join from the meeting link

<https://vdhoep.webex.com/vdhoep/j.php?MTID=m1af84dae70868c4177c63b39f811850e>

Join by meeting number

Meeting number (access code): 132 094 5414

Meeting password: tT2F9zgxsu3

Tap to join from a mobile device (attendees only)

1-844-992-4726, 1320945414## United States Toll Free

1-408-418-9388, 1320945414## United States Toll

Join by phone

1-844-992-4726 United States Toll Free

1-408-418-9388 United States Toll

Global call-in numbers | Toll-free calling restrictions

- 1. Call to Order, Welcome and Introductions**
- 2. Remarks by Senator Ghazala F. Hashmi, Senate District 10**
- 3. Selection of a Chair for the Wastewater Infrastructure Policy Working Group**
- 4. New Business**
 - i. Review and approve Wastewater Infrastructure Policy Working Group guidelines.**
 - ii. Review and approve Wastewater Infrastructure Policy Working Group participants.**
 - iii. Review and approve Wastewater Infrastructure Policy Working Group 2021 Work Plan**

5. **Presentation by Dr. Kirk Havens, Director, Center for Coastal Resources Management, Virginia Institute of Marine Science at the College of William and Mary**
Analysis of Failed, Failing or Threatened Septic Systems in the Coastal Plain
6. **Public comment.**
7. **Adjournment**

§ 62.1-223.1. State policy as to community and onsite wastewater treatment. It is the policy of the Commonwealth to prioritize universal access to wastewater treatment that protects public health and the environment and supports local economic growth and stability.

§ 62.1-223.2. Wastewater Infrastructure Policy Working Group Guidelines To Be Adopted July 12, 2021

Authority - From § 62.1-223.2. Wastewater Infrastructure Policy Working Group

A. The Wastewater Infrastructure Policy Working Group (the Working Group) is established as an advisory board within the meaning of § 2.2-2100 in the executive branch of state government. The purpose of the Working Group is to continually assess wastewater infrastructure needs in the Commonwealth and develop policy recommendations.

B. The Working Group shall have a total membership of four ex officio members. The Director of the Department of Environmental Quality, the State Health Commissioner, the Director of the Department of Housing and Community Development, and the Executive Director of the Virginia Resources Authority, or their designees, shall serve ex officio with voting privileges. A majority of the members shall constitute a quorum.

C. Members of the Working Group shall serve terms coincident with their terms of office.

D. The Working Group shall invite participation in its meetings by:

1. The Virginia Association of Counties;
2. The Virginia Association of Planning District Commissions;
3. The U.S. Department of Agriculture Rural Development;
4. The Virginia Onsite Wastewater Recycling Association;
5. The Virginia Association of Municipal Wastewater Agencies;
6. The Virginia Rural Water Association;
7. SERCAP, Inc; and,
8. Others are determined appropriate by the Working Group.

The Secretaries of Natural Resources, Commerce and Trade, and Health and Human Resources shall provide staff support to the Working Group. The Center for Coastal Resources Management at the Virginia Institute of Marine Science and the Virginia Coastal Policy Center at William and Mary Law School shall advise the Working Group. All agencies of the Commonwealth shall provide assistance to the Working Group upon request.

E. Members of the Working Group shall designate the Chair.

F. The Working Group shall have the following powers and duties:

1. Assess wastewater infrastructure needs in the Commonwealth and develop policy recommendations.
2. Promote public education about the importance of adequate wastewater treatment.
3. Encourage collaboration among local, state, and federal government entities, including consistent collaboration and coordination of grant requirements and timelines.
4. Endorse community-based and regional projects as opposed to cumulative and repetitive site-by-site individual solutions and integrated solutions across sewer and onsite wastewater treatment systems.

5. Support prioritized, focused, and innovative use of state and federal funding to address needs determined pursuant to § 62.1-223.3.

6. Prioritize universal access to wastewater treatment that protects public health and the environment and supports local economic growth and stability.

7. Support the incorporation of the effects of climate change into wastewater treatment regulatory and funding programs.

8. Submit an annual report to the Governor and the General Assembly for publication as a report document as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents and reports. The Secretary of Natural Resources shall submit to the Governor and the General Assembly an annual executive summary of the interim activity and work of the Working Group no later than the first day of each regular session of the General Assembly. The executive summary shall be submitted as a report document as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents and reports and shall be posted on the General Assembly's website.

G. The Working Group shall meet at least quarterly. The Working Group shall establish its rules of order for the conduct of public meetings.

H. The Working Group shall expire on July 1, 2030.

FOR CONSIDERATION:

The following rules are based, in part, on Robert's Rules of Order and provide common rules and procedures for deliberation and debate in order to place the whole membership on the same footing and speaking the same language. The conduct of all business is controlled by the general will of the whole membership. These rules are intended for constructive and democratic meetings, to help, not hinder, the business of the Wastewater Infrastructure Policy Working Group.

Quorum

A majority of the members shall constitute a quorum. To the extent provided by law, participation via conference call or video conferencing shall be considered attendance.

Minutes

Minutes of all meetings shall be taken and shall include a list of all Working Group and invited participant attendees.

Voting Members and Voting

All members of the Working Group in attendance may vote. A plurality of votes can carry a motion; however, the Working Group will seek to reach decisions based upon a consensus of the members.

The rules of the Working Group can be changed by the voting members.

Proxies

Proxy voting is allowed.

Substitutions

The Director of the Department of Environmental Quality, the State Health Commissioner, the Director of the Department of Housing and Community Development, and the Executive Director of the Virginia Resources Authority, may provide a designee to serve on the Working Group. Designees should be identified in advance of a Working Group meeting.

General Order of Meetings

1. Call to Order
2. Approval of Minutes
3. Reports
4. Unfinished (Old) Business
5. New Business
6. Discussion
7. Public Comment
7. Adjournment

Deliberations – General Conduct

1. Visitors may address the Working Group when recognized by the Chair during general business deliberations.
2. Speakers must be recognized by the Chair before speaking. Speakers should identify themselves and address matters pertinent to the discussion.
3. Debate on a motion does not begin until the Chair has stated the motion or resolution and called for discussion on the question.
4. Once discussion on the question is called, Working Group members and invited participants may address the Working Group.
5. The "immediately pending question" is the last question stated by the Chair.
6. The member moving the "immediately pending question" is entitled to preference to the floor.
7. No member can speak twice to the same issue until everyone else wishing to speak has spoken to it once.
8. All remarks must be directed to the Working Group members. Remarks must be courteous in language and deportment.

Procedure to Make a Motion

1. Member obtains recognition from the Chair.
2. Member states the motion. e.g. "I move that we _____."
3. Member may give a brief explanation for introducing the motion.
4. Another member must second the motion to continue.
5. The Chair calls for discussion on this motion.

The member who introduced the motion has the right to speak first. Members wishing to discuss the motion raise their hands and wait for recognition from the Chair before speaking, enabling everyone to share their opinions.

6. The Chair calls for a vote on the motion.

7. The Chair states results of vote and resulting action.

Members may "call the question" to end discussion on the motion if discussion seems to be dragging on or becoming redundant; however, it is NOT acceptable to call the question in order to prevent someone from expressing their opinion or while someone is speaking. If a member calls the question, a second and a 2/3 majority vote are required (no discussion) to close discussion and proceed to voting on the motion.

Procedure to Amend a Motion

During discussion, it may become apparent that an amendment (modification) to the original motion is necessary. Anyone may request to amend the original motion, but the proposed amendment must be related to the subject of the main motion.

1. Member obtains recognition from the Chair.

2. Member states the amendment (e.g. striking and/or adding words/phrases).

3. Amendment must be seconded.

4. The Chair calls for discussion on the amendment.

5. The Chair calls for a vote on the amendment, and announces result.

If the amendment passes, the motion on the floor is now the amended motion. If the amendment fails, the original motion remains on the floor.

Referral to Working Group

~~During discussion, it may become apparent that further information is needed prior to voting on a motion and/or further work is necessary to reword a motion, in which case, the motion may be referred to a Working Group. If the motion passes, the Working Group, if not existing, should be appointed immediately or as soon as possible. The Working Group should report findings at the next meeting, unless specified otherwise.~~

~~1. A member makes a motion to refer the motion to Working Group.~~

~~2. Motion must be seconded.~~

~~3. The Chair calls for discussion.~~

~~4. The Chair calls for a vote, and states result of the vote and action taken.~~

Tabling a Motion

Tabling a motion lays aside an item of business temporarily in order to attend other business. A tabled motion cannot be taken from the table until another item of business has been transacted since the tabling. If the tabled motion is not removed from the table by the end of the next meeting, the motion ceases to exist.

1. A member makes a motion to table the motion.
2. Motion must be seconded (No discussion).
3. The Chair calls for a vote, and states result of the vote and action taken.

Removing a Motion from the Table

A member may move to remove a motion from the table during the Unfinished Business part of the meeting once all agenda Unfinished Business items are addressed.

1. A member makes a motion to remove a motion from the table.
2. Motion must be seconded.

At this point, the motion has been removed from the table and discussion of the motion proceeds as if the motion had never been tabled in the first place.

3. The Chair calls for discussion.
4. The Chair calls for a vote, and states result of the vote and action taken.

Motion to Postpone

A member may move to delay action (voting) on a motion to a certain time, usually the next meeting. A postponed motion is considered unfinished business and automatically comes up for further consideration at the next meeting (or designated date).

1. A member makes a motion to postpone the motion to another date (usually the next meeting).
2. Motion must be seconded.
3. The Chair calls for discussion.
4. The Chair calls for a vote, and states result of the vote and action taken.

**§ 62.1-223.2. Wastewater Infrastructure Policy Working Group
2021 Work Plan
To Be Adopted July 12, 2021**

Working Group Meeting #1. July 12, 2021. Review and finalize administrative actions, approve work plan for 2021, presentation on wastewater infrastructure needs in the Commonwealth.

Roundtable Discussion with Working Group Participants facilitated by VDH and OSNR on the following issues:

- A. How to promote public education about the importance of adequate wastewater treatment?
- B. How to encourage collaboration among local, state, and federal government entities, including consistent collaboration and coordination of grant requirements and timelines?
- C. How to endorse community-based and regional projects as opposed to cumulative and repetitive site-by-site individual solutions and integrated solutions across sewer and onsite wastewater treatment systems.
- D. How to support prioritized, focused, and innovative uses of state and federal funding to address needs determined pursuant to the wastewater infrastructure needs assessment required under § 62.1-223.3.

Working Group Meeting #2. Fall, 2021. Consider feedback from roundtable discussion with Working Group Participants and update on the wastewater infrastructure needs assessment required under § 62.1-223.3. Review and discuss initial draft of first annual report for submission to the Governor and General Assembly.

Working Group Meeting #3. Early winter, 2021. Review and approve first annual report for submission to the Governor and General Assembly.

§ 62.1-223.1. State policy as to community and onsite wastewater treatment. It is the policy of the Commonwealth to prioritize universal access to wastewater treatment that protects public health and the environment and supports local economic growth and stability.

§ 62.1-223.2. Wastewater Infrastructure Policy Working Group Membership Adopted July 12, 2021

The Working Group shall have a total membership of four ex officio members. The Director of the Department of Environmental Quality, the State Health Commissioner, the Director of the Department of Housing and Community Development, and the Executive Director of the Virginia Resources Authority, or their designees, shall serve ex officio with voting privileges. Members of the Working Group shall serve terms coincident with their terms of office. A majority of the members shall constitute a quorum.

VDH

Dr. Norm Oliver, Commissioner

Lance Gregory, Director, Division of Onsite Sewage and Water Services, Environmental Engineering, and Marina Programs, VDH

DEQ

David Paylor, Director, DEQ

Karen Doran, Clean Water Financing and Assistance Program Manager, DEQ

VRA

Stephanie Hamlett, Executive Director, VRA

Shawn Crumlish, Director of Financial Services, VRA

DHCD

Erik Johnston, Director, DHCD

Jay Grant, Deputy Director of Community Development, DHCD

Matt Weaver, Policy and Legislative Director, DHCD

The Working Group shall invite participation in its meetings by the Virginia Association of Counties, the Virginia Association of Planning District Commissions, the U.S. Department of Agriculture Rural Development, the Virginia Onsite Wastewater Recycling Association (VOWRA), the Virginia Association of Municipal Wastewater Agencies (VAMWA), the Virginia Rural Water Association, and SERCAP, Inc.

Virginia Association of Counties, Chris McDonald

Virginia Association of Planning District Commissions, David Blount, Deputy Director, Thomas Jefferson PDC and Jessica Steelman, A-NPDC Coastal Planner, Jim Baldwin, Cumberland Plateau PDC Executive Director, Debbie Milton, Senior Planner, Cumberland Plateau PDC, Duane Miller, Executive Director, LENOWISCO, Aaron Sizemore, Executive Director Mt. Rogers PDC

USDA Rural Development, Terry Rosta, Perry Hickman

VOWRA, Danna Revis

VAMWA, Chris Pomeroy, Justin Curtis

Virginia Rural Water Association, Mike Ritchie

SERCAP, Hope Cupit, Andy Crocker, Jay Dillon
Virginia Council on Environmental Justice, Reverend Dr. Faith B. Harris
Hampton Roads Sanitation District, Ted Henifin
Virginia Conservation Network, Pat Calvert
Virginia Municipal League, Michelle Gowdy

Office of the Secretary of Natural Resources, Ann Jennings
Office of the Secretary of Health and Human Resources, Rachel Becker
Office of the Secretary of Commerce and Trade

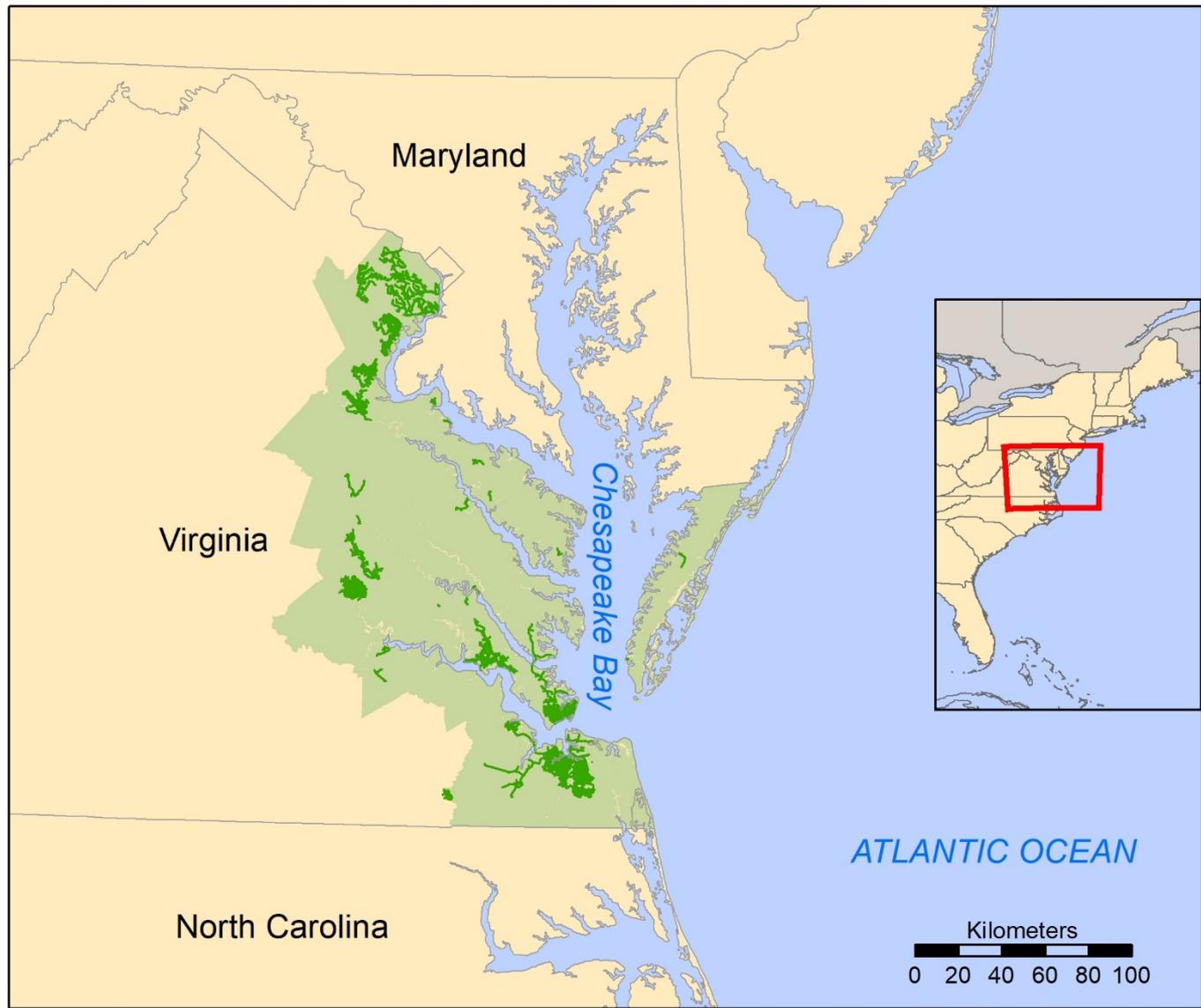
Center for Coastal Resources Management, Virginia Institute of Marine Science, Dr. Kirk
Havens
Virginia Coastal Policy Center, William and Mary Law School, Elizabeth Andrews
Virginia Department of Health, Julie Henderson, Karri Atwood

PREDICTION OF FUTURE SEPTIC SYSTEM FAILURE SITES

Molly Mitchell
Robert Isdell
Julie Herman
Christine Tombleson

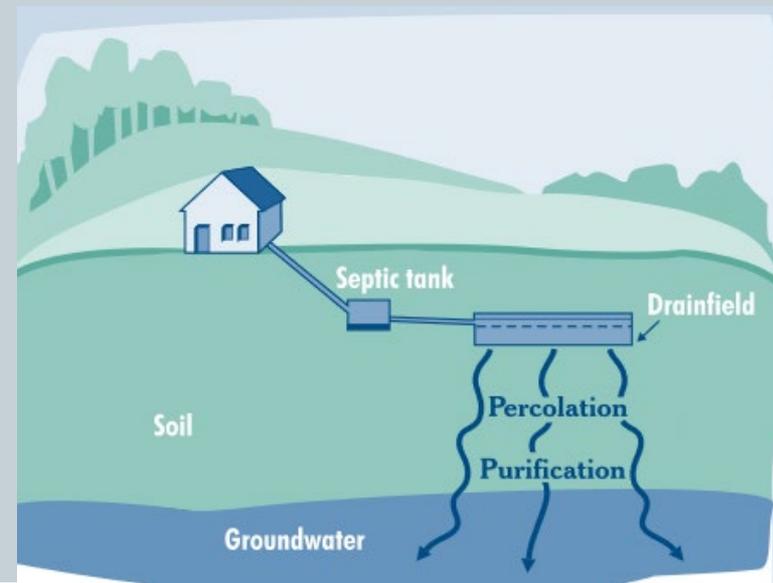
**Collaborating with: Division of Data Management and
Process Improvement at VDH**

**Wastewater Infrastructure Policy Working Group
July 12, 2021**



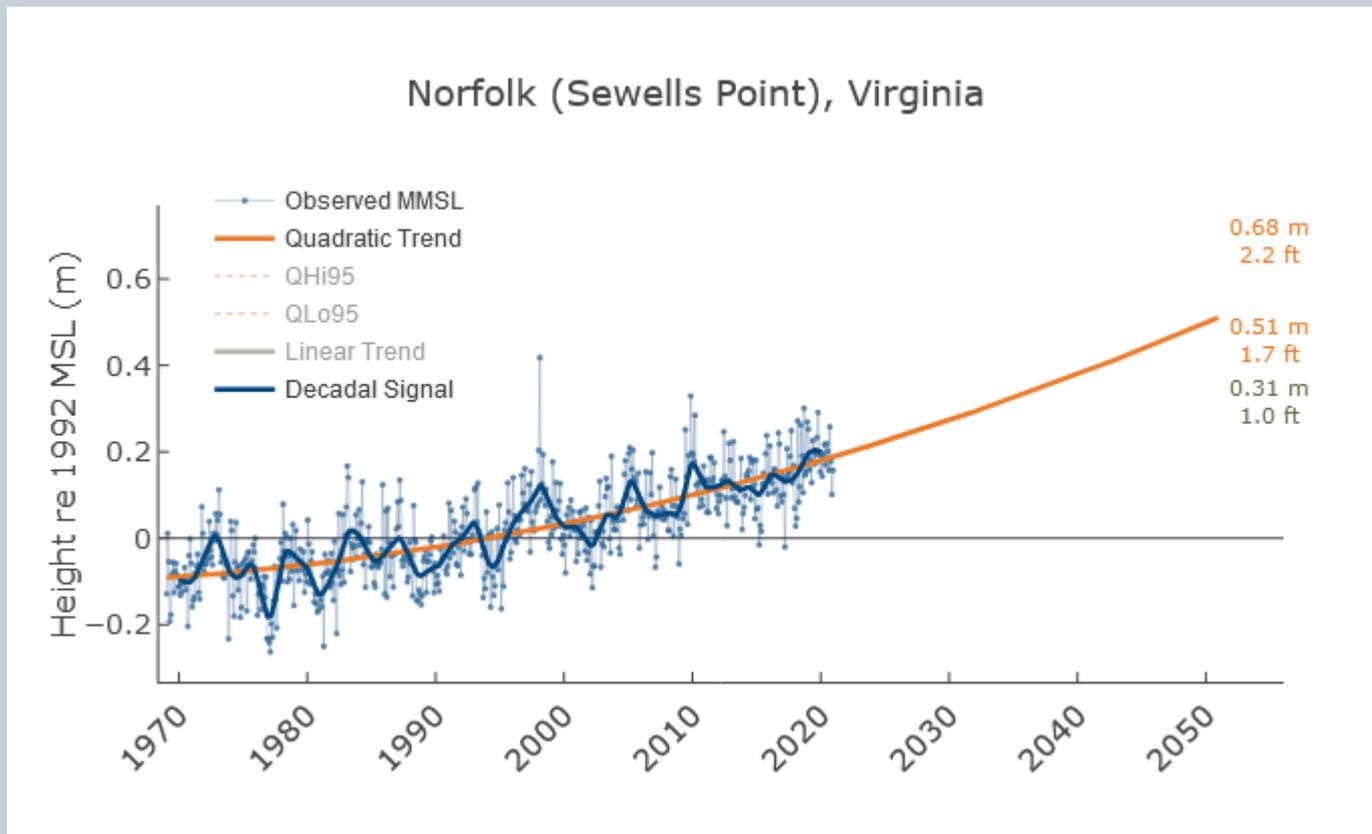
THE PROBLEM WITH COASTAL SEPTIC SYSTEMS

- Traditional, in-ground septic systems require unsaturated sediment to function
- Sea level is rising quickly in Virginia
- Sea level rise is increasing water table levels leading to septic system failure
- Failing septic systems result in an increased loading of **bacteria, viruses, nitrogen** and possibly phosphorus to adjacent waterways



EPA-832-B-02-005

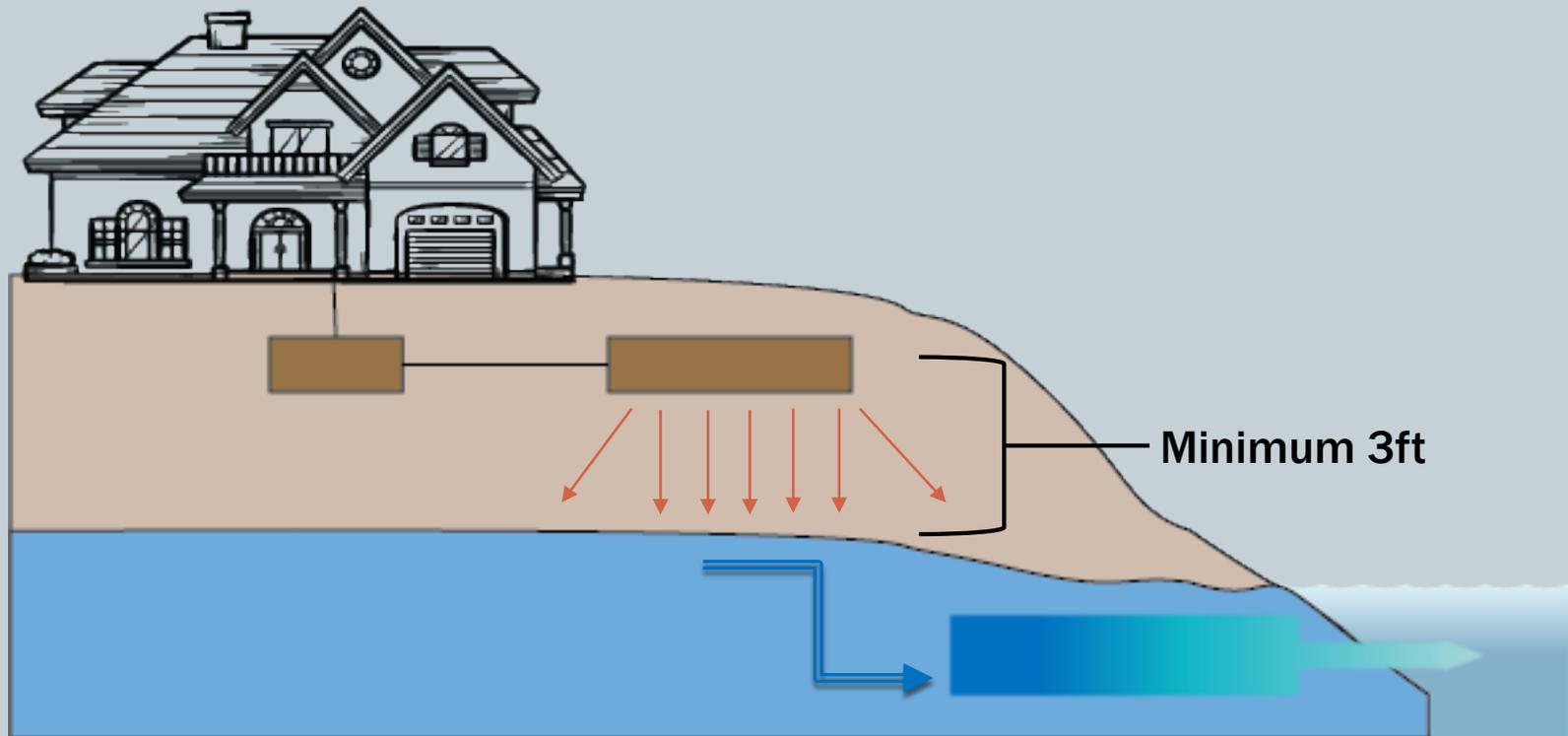
SEA LEVEL RISE IN VIRGINIA



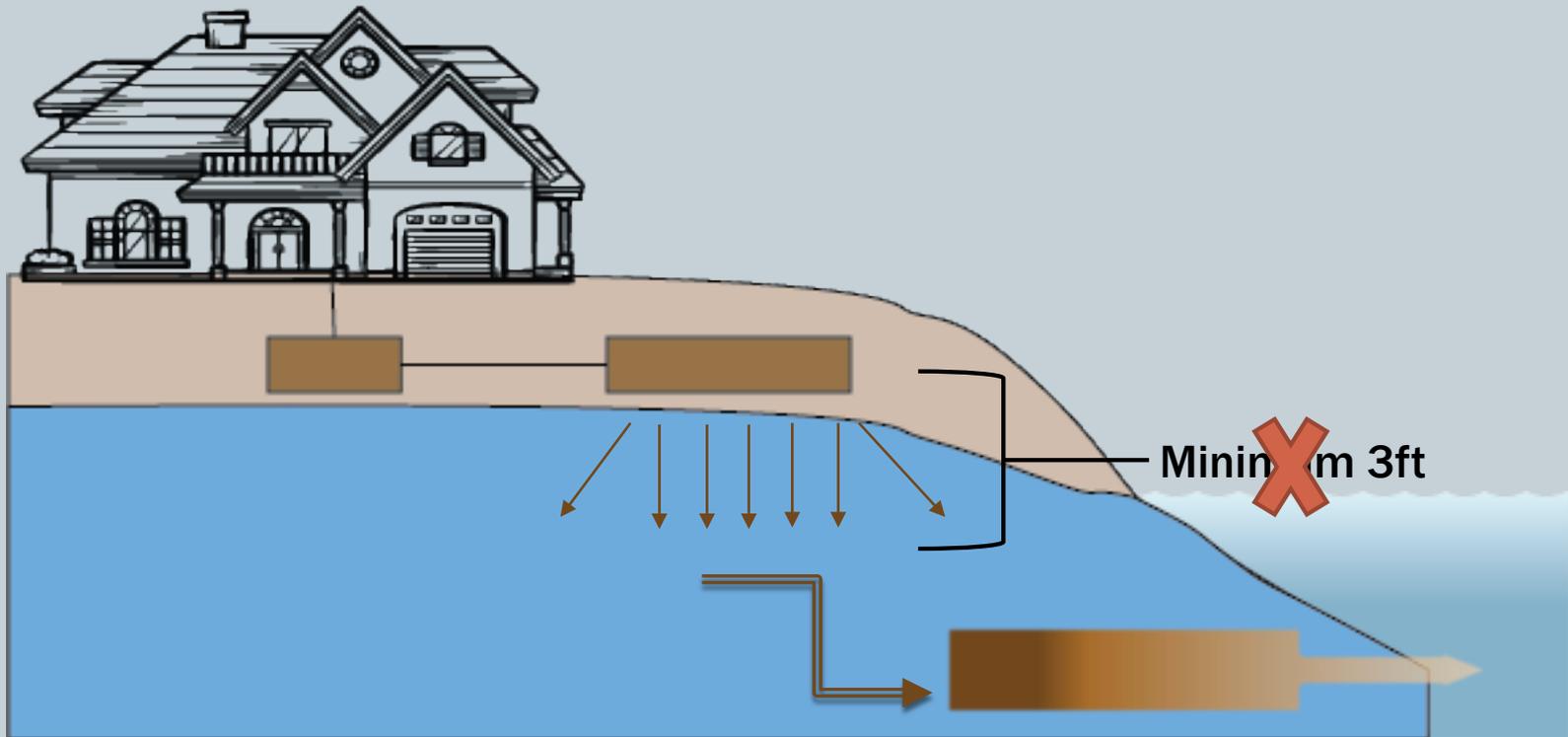
2020 rate of rise: 5.385 mm/yr

2020 rate of acceleration: 0.131 mm/yr²

SEA LEVEL RISE AND SEPTIC

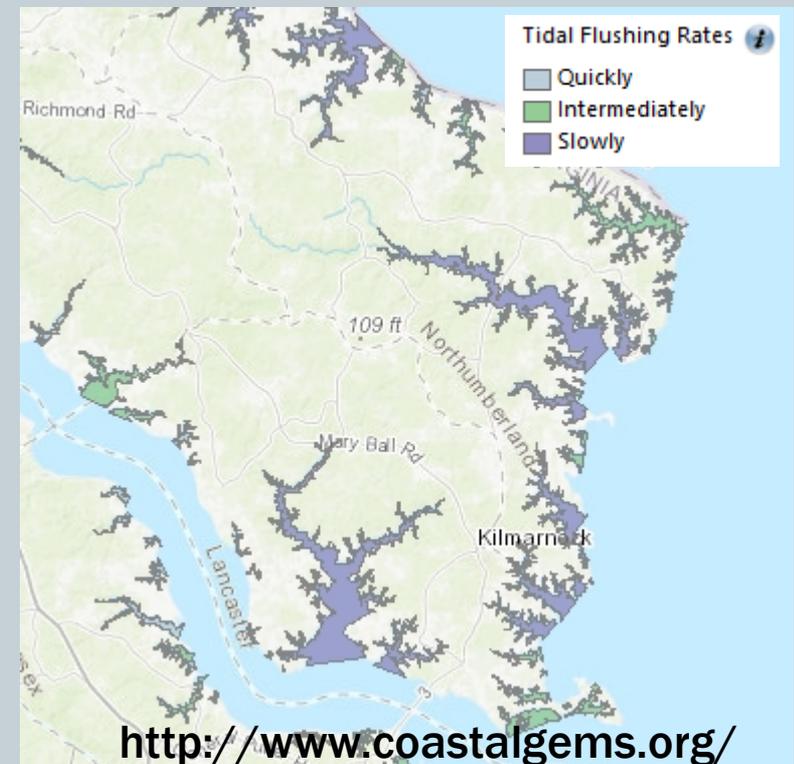


SEA LEVEL RISE AND SEPTIC



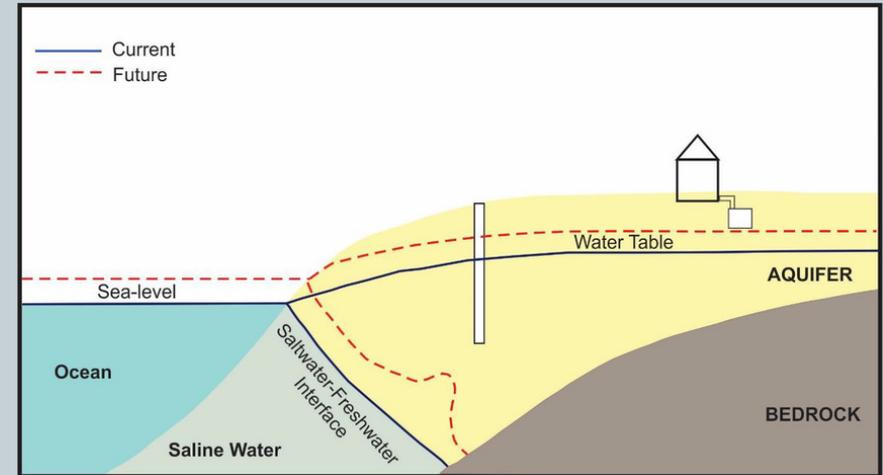
FAILING SEPTIC SYSTEMS...

- Contribute as much as 6% of the total nitrogen load from the Chesapeake watershed (Bay Watershed Model 2009 Scenario, Chesapeake Bay TMDL)
- In small waterbodies, the local impact can be much higher.
 - For example, in Buttermilk Bay, MA, 74% of the nitrogen was attributed to septic systems (Horsley Witten Hegeman. Inc. 1991)
- Strength of the relationship depends on tidal flushing or the prevalence of tidal marshes (Giordano et al. 2011)
- Can also cause bacterial contamination of groundwater (e.g., Stewart & Reneau, 1981, Arnade 1999)

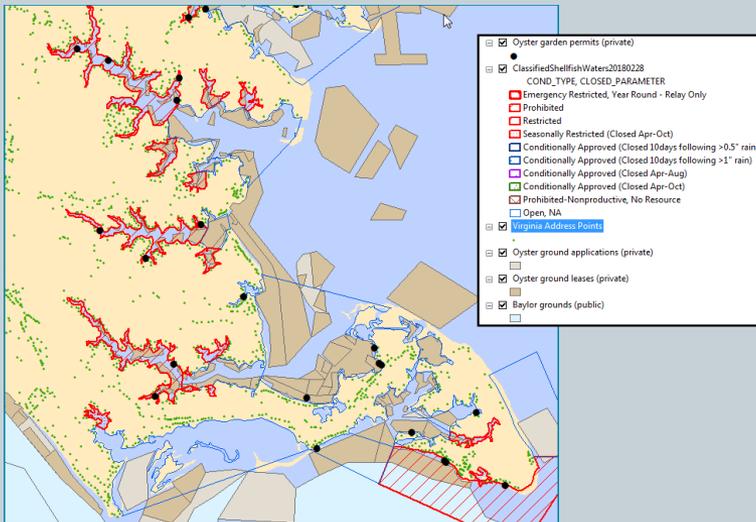


PROJECT GOAL

- Assess changes in septic failure rates with changing climate conditions (e.g., sea level rise, increased precipitation)



- Assess impacts of increased septic failures on water quality (under current conditions)



REASONS FOR FAILURES

ONLY DATASET AVAILABLE—PERMITS FOR REPAIRS

■ Human

- Poor maintenance
- Parking on septic field

■ No known proxies—but humans predictability is low

■ Structural

- Age of system (20-40 year lifespan)
- Type of system

■ Some proxies, but hard to actually know

■ Geologic

- High water table (seasonal or permanent)
- Low soil permeability

■ Potential proxies for evaluation & responsive to changing conditions

**Repair
permits**

(▪)

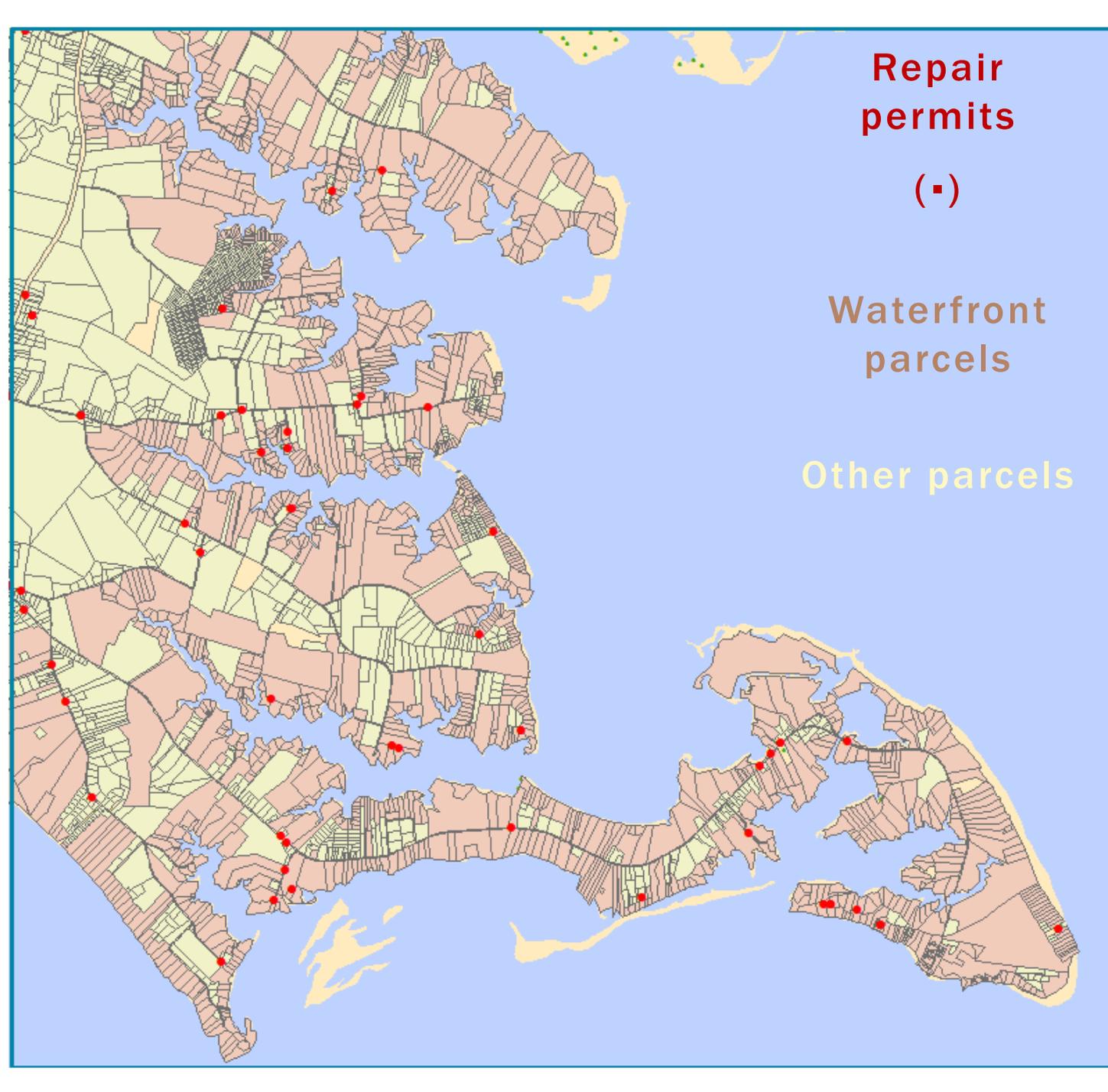
**Waterfront
parcels**

Other parcels

UNDERLYING
DATA

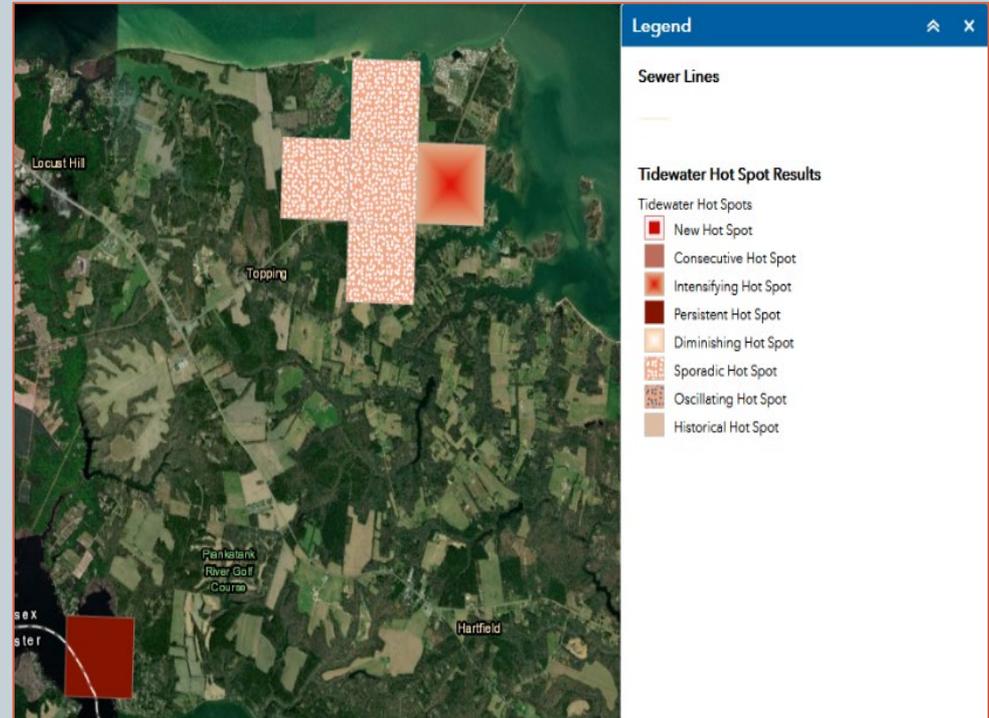
9 YEARS OF
DATA

Statistically
analyze the
temporal &
geospatial
distribution
of permit
repairs to
find
underlying
patterns that
could help
inform
decision-
making.

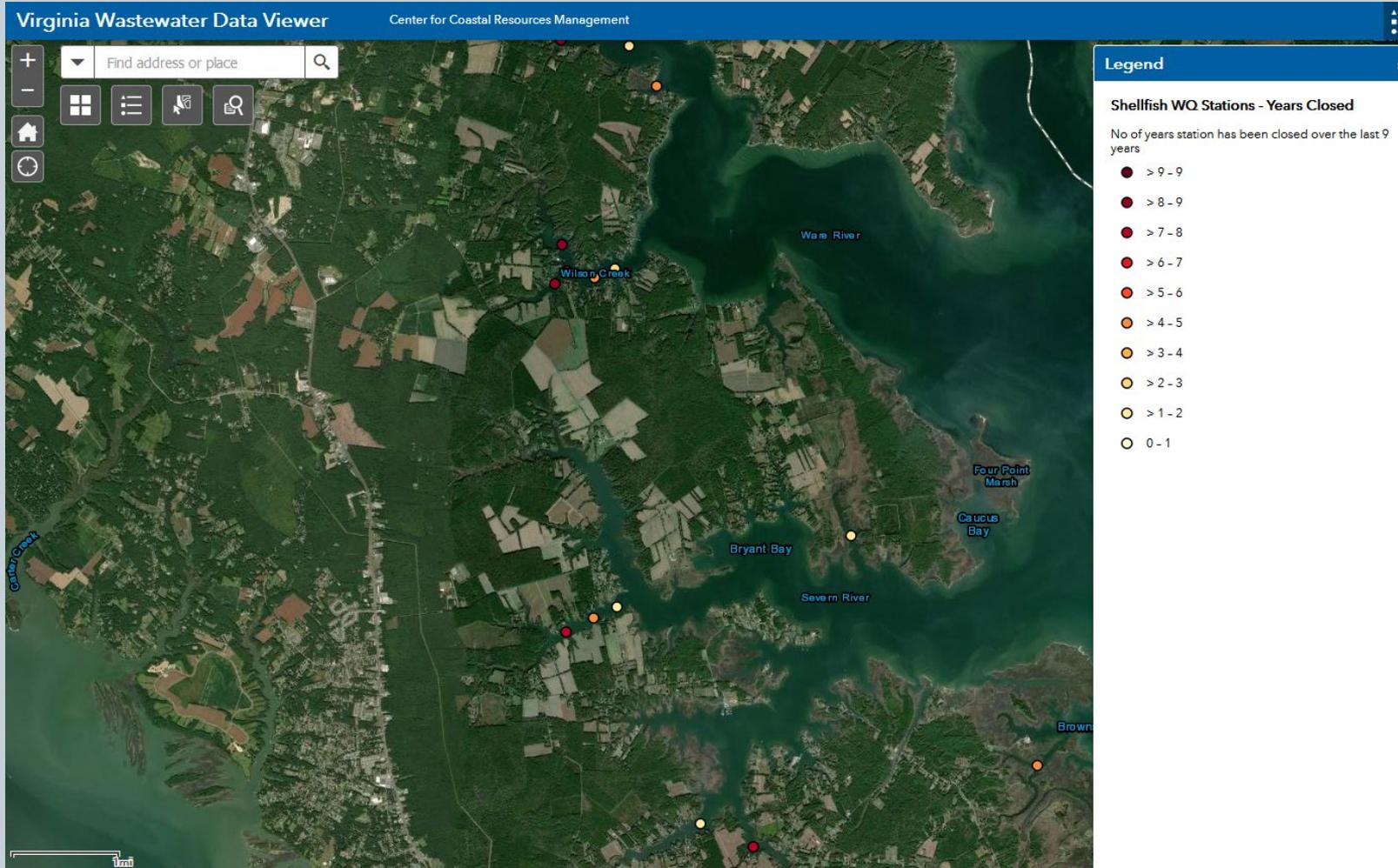


CONSIDERING GEOSPATIAL/TEMPORAL PATTERNS

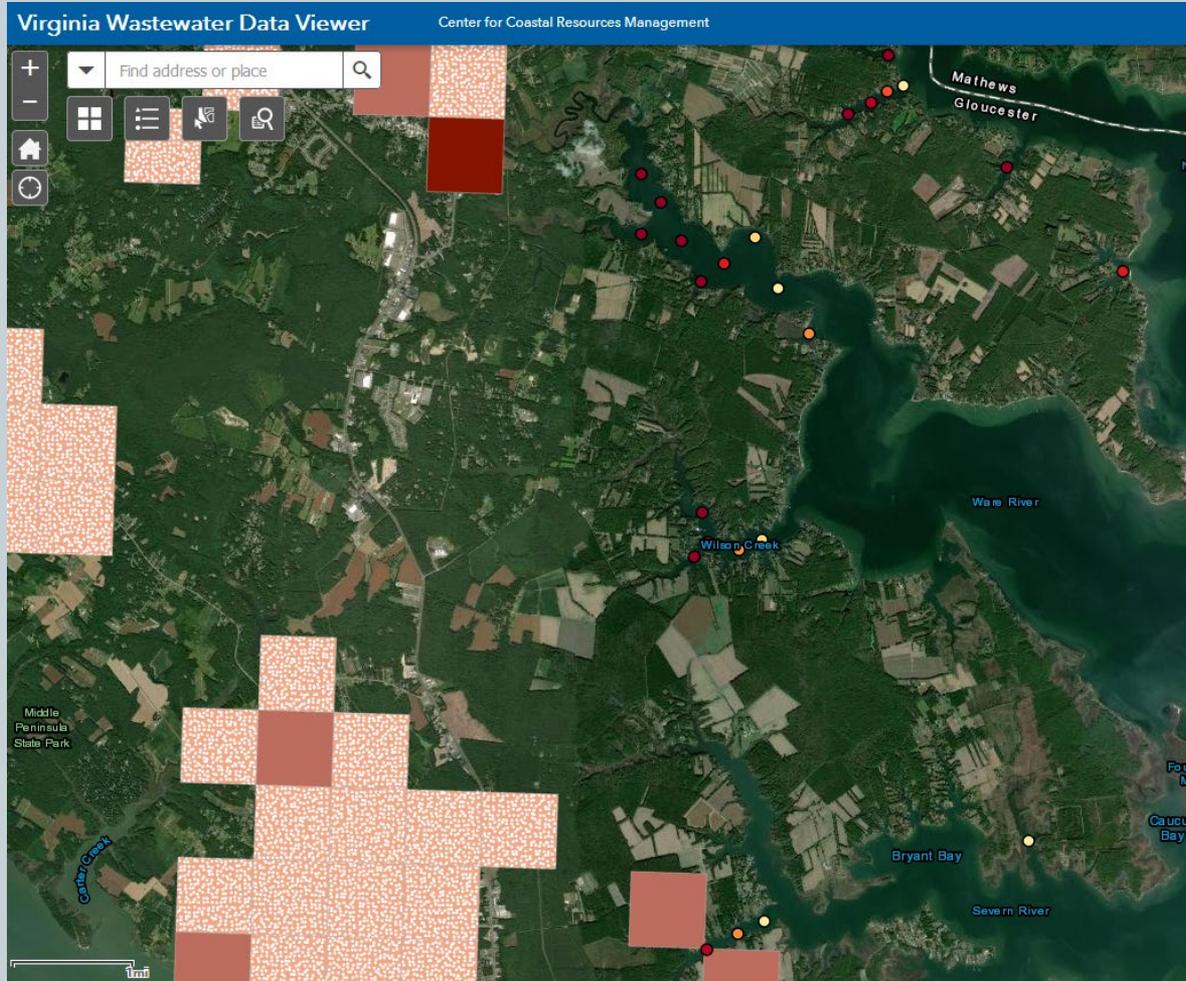
- **Consecutive/Persistent hotspots 38%** (current issues)
 - Target for sewer systems?
 - Active and continuous monitoring of adjacent waterbodies
- **Intensifying hotspots 3%** (emerging issues)
 - High risk of failures under increased sea level
- **Sporadic hotspots 47%**
 - These are likely due to years of high water table
 - They are at high risk of failures under increased precipitation



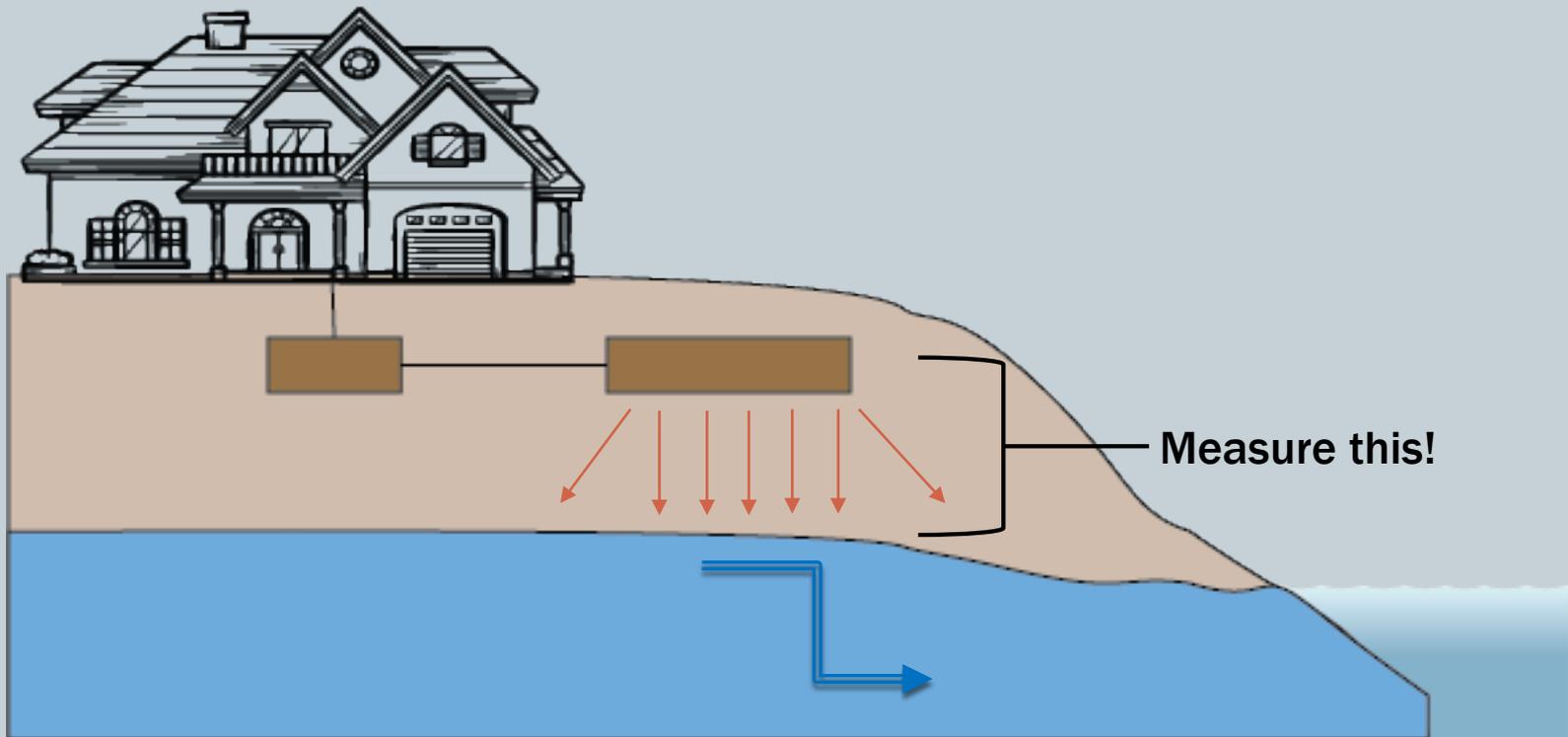
WATER QUALITY IMPACTS

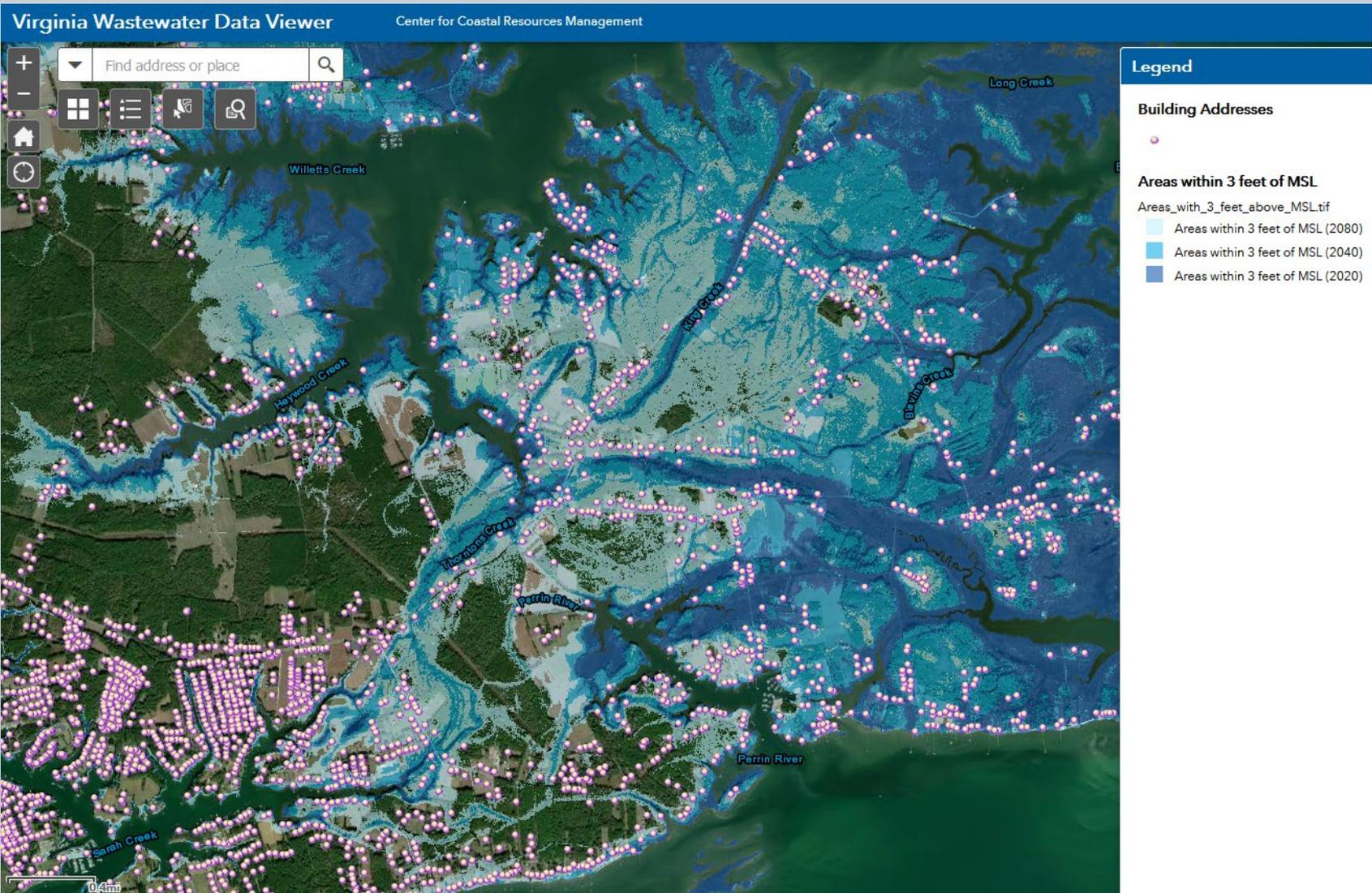


WATER QUALITY IMPACTS



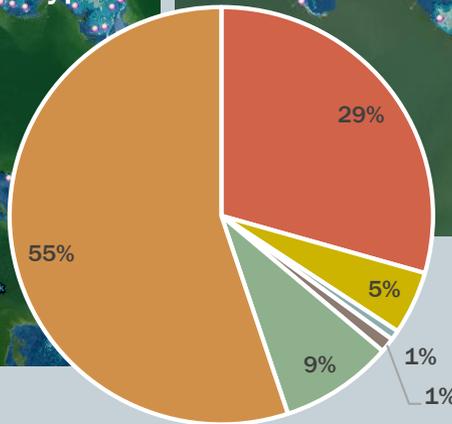
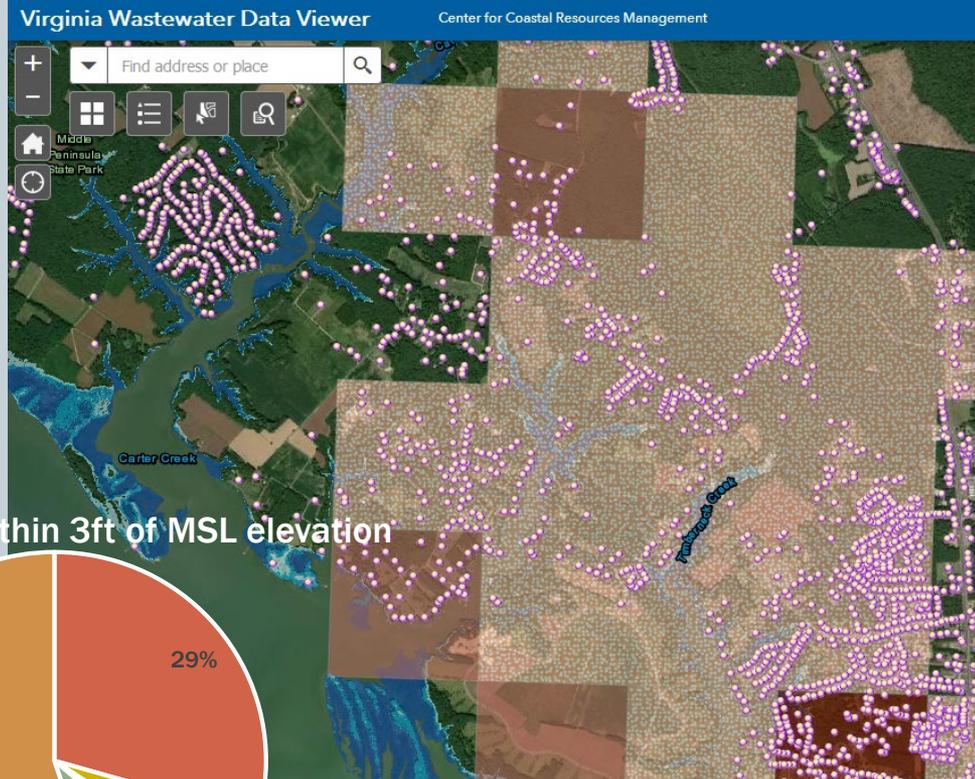
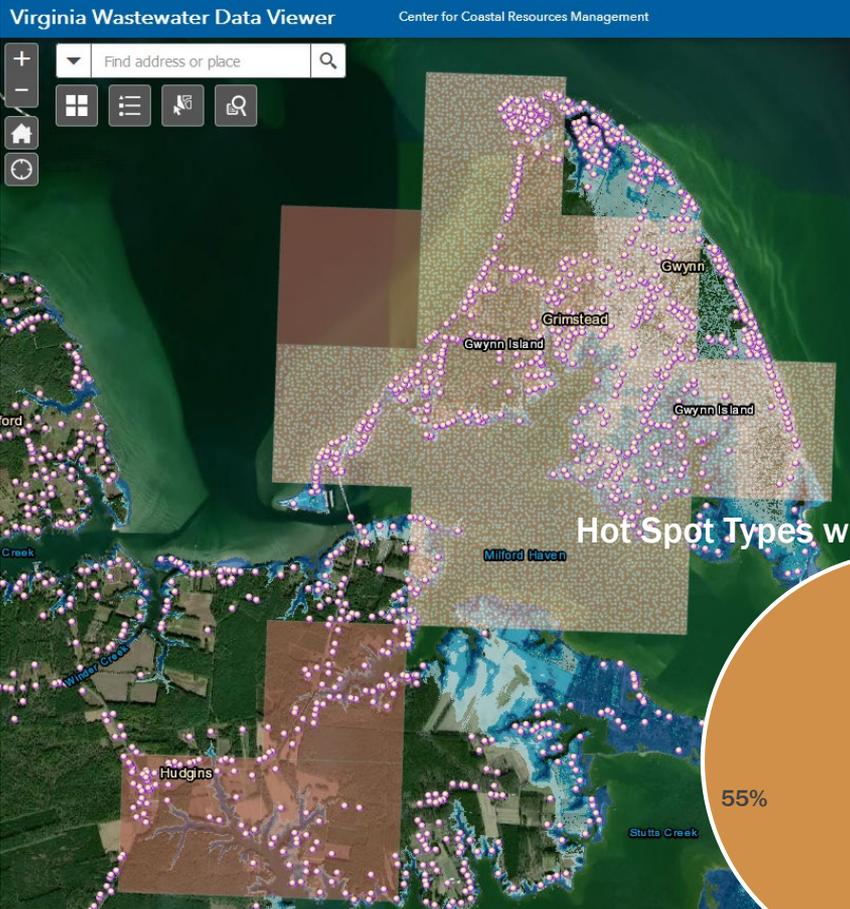
SEA LEVEL RISE IMPACTS





Northern Neck Environmental Justice / Vulnerable communities project (Jesse Ball DuPont Project)

SEA LEVEL RISE WATCHLIST



Septic System Life Expectancy mapping

■ Consecutive
 ■ Diminishing
 ■ Historical
 ■ Intensifying
 ■ Persistent
 ■ Sporadic

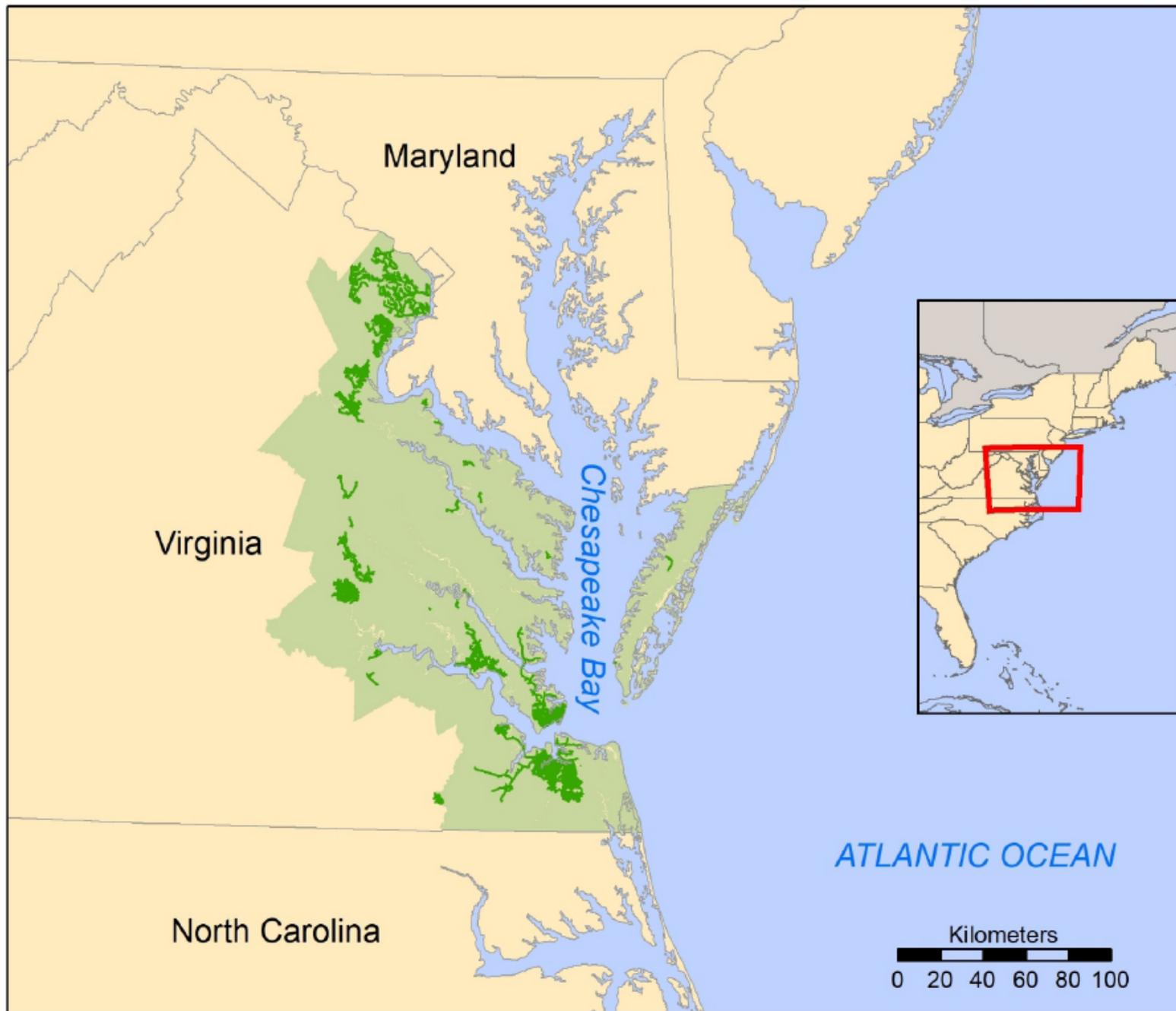
Driving forces:
Need for waste management

Responses:
Alternative waste management system (centralized or aboveground decentralized) ?

Activities:
Construction of private septic systems (decentralized)

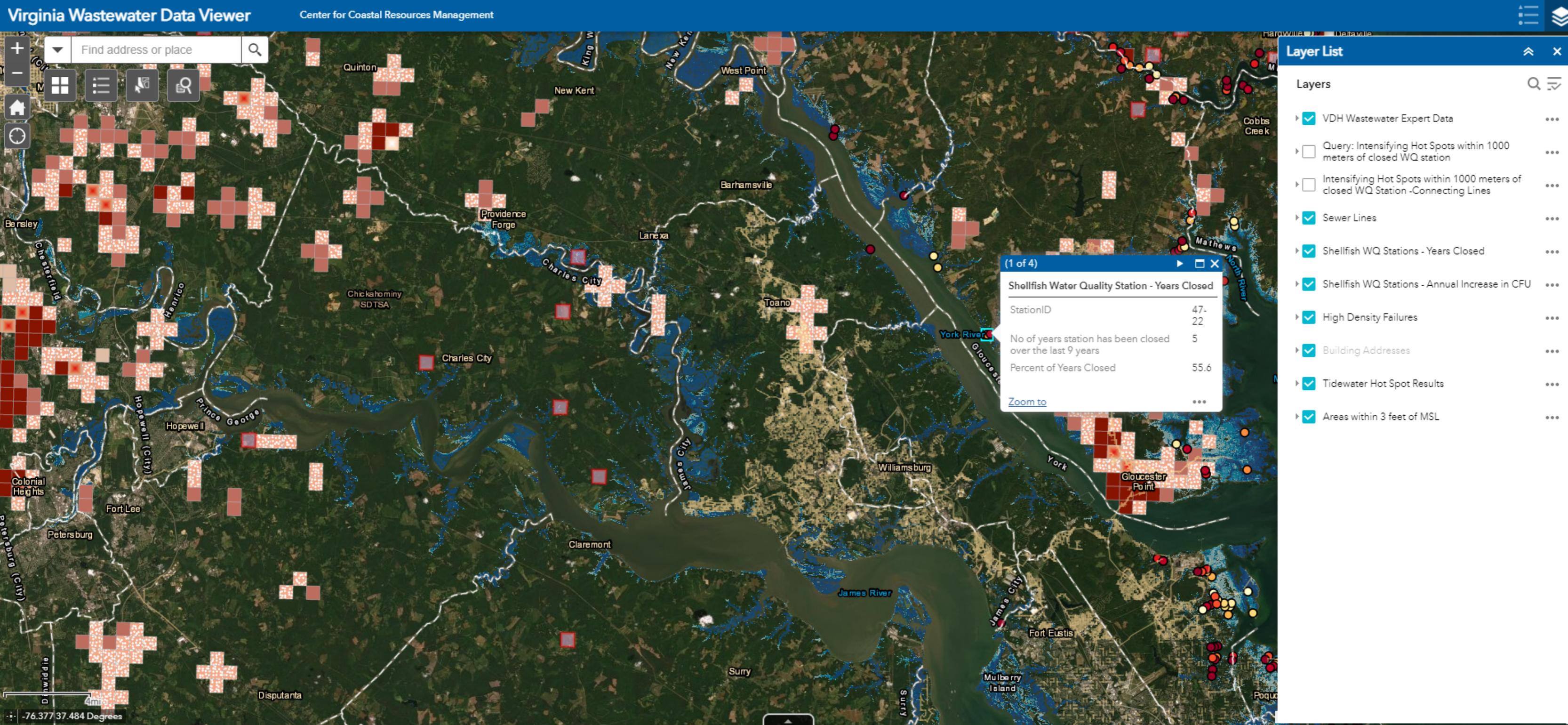
Impacts:
Bacterial contribution to waterbodies leads to human health and food safety concerns

State changes:
Sea level rise-induced system failures



Find address or place

Map navigation controls: Home, Refresh, Full Screen, Search, Scale, and other standard GIS tools.



(1 of 4)

Shellfish Water Quality Station - Years Closed

StationID	47-22
No of years station has been closed over the last 9 years	5
Percent of Years Closed	55.6

[Zoom to](#)

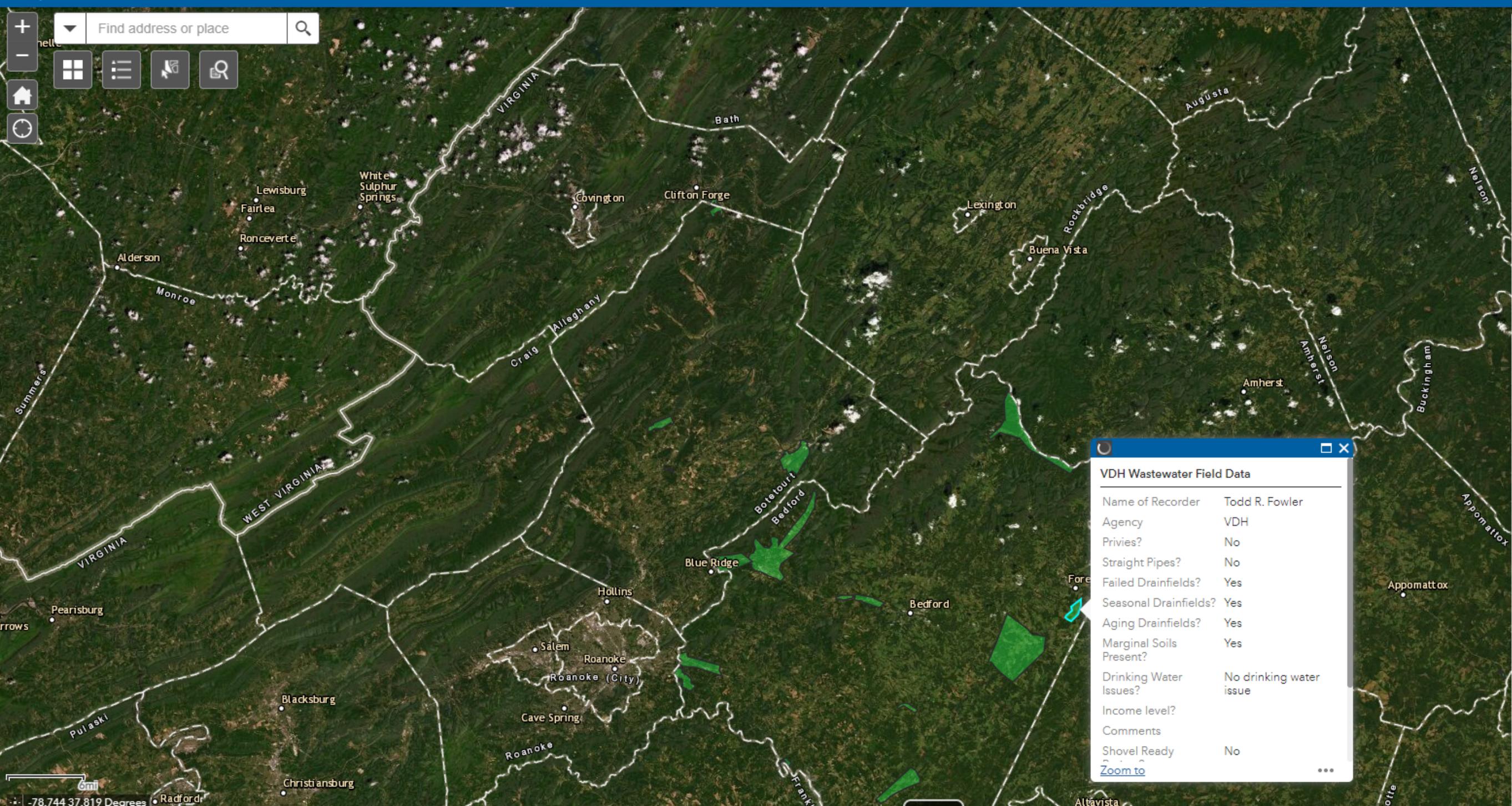
Layer List

Layers

- VDH Wastewater Expert Data
- Query: Intensifying Hot Spots within 1000 meters of closed WQ station
- Intensifying Hot Spots within 1000 meters of closed WQ Station -Connecting Lines
- Sewer Lines
- Shellfish WQ Stations - Years Closed
- Shellfish WQ Stations - Annual Increase in CFU
- High Density Failures
- Building Addresses
- Tidewater Hot Spot Results
- Areas within 3 feet of MSL

Find address or place

Map navigation controls: Home, Full Screen, Layers, Search, Refresh, Zoom In, Zoom Out



Layer List

Layers

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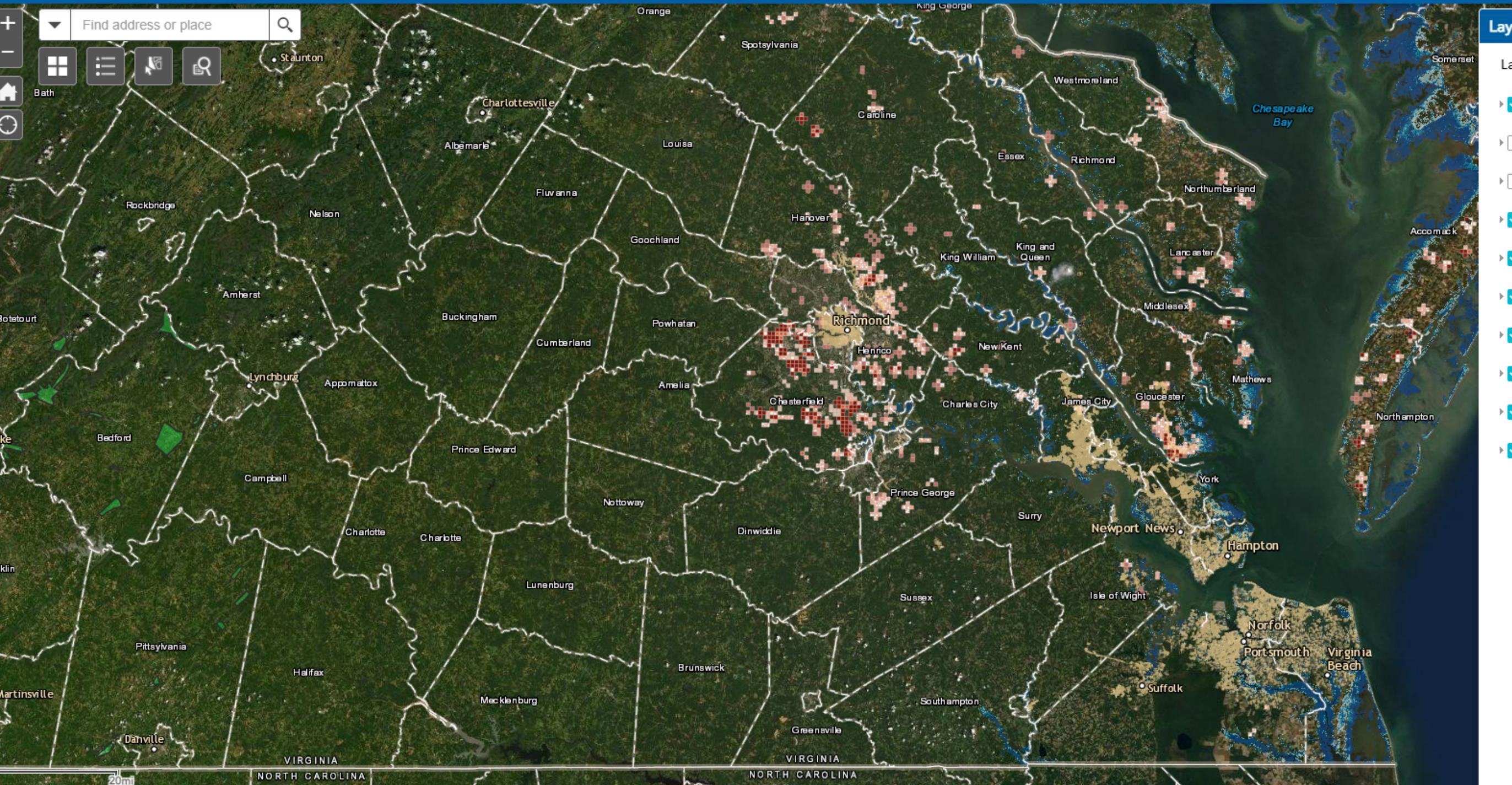
VDH Wastewater Field Data

Name of Recorder	Todd R. Fowler
Agency	VDH
Privies?	No
Straight Pipes?	No
Failed Drainfields?	Yes
Seasonal Drainfields?	Yes
Aging Drainfields?	Yes
Marginal Soils Present?	Yes
Drinking Water Issues?	No drinking water issue
Income level?	
Comments	
Shovel Ready	No

[Zoom to](#) ...

Find address or place

Map navigation icons: Home, Full Screen, Refresh, Search, Bath, etc.



Layer List

Layers

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IMPORTANT POINTS

- All of this data is collected for regulatory/permitting processes, not this type of analysis
- BUT geospatial examination of patterns can allow targeting of monitoring and adaptive actions

QUESTIONS?

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